

MPR 8730.1

REVISION F

EFFECTIVE DATE: September 30, 2004

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MARSHALL PROCEDURAL REQUIREMENTS

QD01

INSPECTION AND TESTING

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		5/14/99	Document converted from MSFC-P10.1 to a Directive. Previous history retained in system as part of canceled or superseded ISO Document files. Remove NASA meatball and MSFC address; change reference document in last sentence of paragraph 4.1.2 from MSFC-P13.1 to MM 4000.1, update footer.
Revision	A	8/23/99	OPR reorganization change from CR01 to QS01; update applicability, par P.2; update P.3 & P.4 with new document numbers; update P.6; add definition for final acceptance, par 1.3; update definition for final inspection, par 1.4; update definition title to change from testing to test monitoring, par 1.5; change MA to MR, par 1.7; update definition for quality and non-quality sensitive, par 1.9 & 1.12; update process operator par 1.10; add definition for S&MA par 1.14; add definition for test organization acronym (TO), par 1.16; add definition for test readiness reviews, par 1.17; add definition for -900, par 1.20; update for reorganizational changes, Property Management Group, par 2.1; update S&MA detail requirements and reference documents, par 2.3; update program office requirements, par 2.4; add testing organization requirements, par 2.5; update detail and reference document requirements and reference documents, par 3.0.
Revision	B	3/2/00	P1 & P2, update for scope requirements; P4, add AD01 MWI's, remove MM 4000.1 and update quality records reference document; P6, update cancellation; Section 1, Definitions, delete reference to Chief Engineer acronym, 1.1 and add acronym for Systems Engineer, 1.14; 1.4 add testing; 1.8, update definition for non-quality sensitive; 1.11, update definition for quality sensitive; 1.13, update definition for S&MA acronym, clarify 1.17 to include management; update 2.1.1, 2.1.2 for documentation changes: updated 2.1.5, 2.2.3, 2.3.1, 2.3.6, 2.4.1 to add project to program; update 2.4.4 to delete scope statement; update 2.4.2 to identify Departments/Issuance's; update 2.4.2, 2.5.3, 3.1.1, 3.1.2, 3.1.4, 3.1.5, 3.1.7 to replace MM 4000.1 requirements; 2.6, add Facilities Engineering Department responsibilities; 3.1.1, 3.2.1, 3.3.1, add Facilities Engineering Department reference; 3.1.7, 3.2.3, updated to reflect use of MSFC-TAG-6, for recall; 3.2.3, add acronym SE; update 3.3.2 to clarify use of Discrepancy Record; update 4.0 for new quality records reference document.
Revision	C	5/15/01	Section P4 corrected title for P.4i; Section P.4p, P.4q, P.4r, P.4s, pars 2.3.2, 2.3.3, 2.3.5, 3.1.2, 3.2.1, to remove reference documents and subsequent references with the noted paragraphs due to the update of MWI 7120.1 which has been updated to meet ISO 9001:2000; update P.6 for document cancellation; update par. 2.3.2 to correct the update the references; update par 2.4.2 to update references to issuances and delete the example; update header for revision and page numbers.
Revision	D	4/24/03	Update the footer to correct MIDL web address; update P.2 to note First Article Inspection process as not applicable within the Center; Remove P.4a & P.4l; update P.6; revise 1.15 to remove element of inspection; revise 2.3.5 to detail inspection documentation; add paragraph 2.3.7 to address raw material validation testing; revise 2.5.2 to address monitoring and unplanned events; update paragraph 3.1.2 to assure validation testing; remove reference to QA OI document.
Revision	E	01/14/2004	Revised P.1 and P.2 to limit the scope to flight hardware, flight software, flight-associated ground support equipment, and other quality sensitive

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			products. Minor editorial corrections to 1.2, 1.6, 1.8, 1.11, 2.1, 2.2, and 2.5.2.
Revision	F	9/30/2004	Generic changes made to remove ambiguity regarding requirements within the document, updated S&MA Directorate identification both within the text and header; P.4j/2.3.2 updated due to name change; update to clarify 2.3.3

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PREFACE

P.1 PURPOSE

The purpose of this document is to provide inspection and testing procedural requirements for receiving, in-process, and final processing of flight hardware, associated flight support equipment, and other quality sensitive products provided by Marshall Space Flight Center (MSFC) as required by MPD 1280.1, “Marshall Management Manual,” (MMM).

P.2 APPLICABILITY

This procedure shall apply to all offices, departments, and organizations that fabricate, assemble, test, or perform other processes (i.e., any process performed between MSFC's receipt of articles and materials and the transfer of products to the customer, inclusive) on flight hardware, flight software, associated ground support equipment (GSE) interfacing with flight hardware and software, and other quality sensitive products. First Article inspection is not included in this procedure (Reference MPD 1280.1).

P.3 AUTHORITY

MPD 1280.1, “Marshall Management Manual”

P.4 APPLICABLE DOCUMENTS

- a. MPD 1280.1, “Marshall Management Manual”
- b. MPR 1440.2, “MSFC Records Management Program”
- c. MPR 5000.1, “Purchasing”
- d. MPR 7120.1, “Program/Project Planning”
- e. MPR8040.1, “Configuration Management, MSFC Programs/Projects”
- f. MPR 8060.1, “Flight Systems Design/Development Control”
- g. MPR 8730.3, “Control of Nonconforming Product”
- h. MWI 4520.1, “Receiving”
- i. MWI 4530.1, “Flight Hardware Support Operations (FHSO) Component Acquisition, Inventory Control, and Kitting Services”
- j. MWI 5100.1, “Initiating Procurement Requisitions”

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k. MWI 7120.1, “Program/Project Quality Plan”

l. MWI 8730.1, “Equipment Logs/Records”

m. MWI 8730.2, “Temporarily Installed Hardware Control”

P.5 REFERENCES

None

P.6 CANCELLATION

MPG 8730.1E dated January 14, 2004

Original signed by
Robin N. Henderson for

David A. King
Director

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DOCUMENT CONTENT

1. DEFINITIONS

1.1 Contracting Officer (CO). A person, appointed in accordance with the Federal Acquisition Regulation (FAR), with the sole authority to enter into, administer, and/or terminate Government contracts and make related determinations and findings.

1.2 Final Acceptance. A process performed to ensure all articles and materials meet the specified program/project quality requirements as documented and released through the approved program configuration management plan. This includes the closure of all applicable nonconformance reports and approval of all deviations and waivers.

1.3 Final Inspection. A process performed to verify conformance of the product to the specified requirement by inspection and/or test. The process assesses whether all specified inspections and tests have been carried out and that the results meet specified program/project quality requirements. It ensures that all open work and/or nonconformances to be forwarded with the articles and materials to our customer are properly documented and approved by the Project Office.

1.4 In-process Inspection and Test Monitoring. A process performed to verify characteristics of an item defined by the program/project quality requirements and/or documented procedures during the manufacturing, assembly, and test operations.

1.5 Inspection. The examination and testing of supplies and services (including, when appropriate, raw materials, components, and intermediate assemblies) to determine whether they conform to specified requirements.

1.6 Mandatory Requirements (MR). Documented requirements for actions and/or characteristics for inspection, witnessing, verification, or monitoring by the delegated quality assurance element.

1.7 Monitoring. Less than 100 percent surveillance of an operation, test, etc. The degree of monitoring has to be specifically documented.

1.8 Non-quality Sensitive. A term used to identify equipment, hardware, software, or material not directly related to flight systems (e.g., mock-up, development hardware and software, industrial machinery, laboratory equipment). Hardware or software procured for development activities is non-quality sensitive unless the data resulting from development activities is to be used in the “justification for qualification” of flight hardware, software, or flight-associated hardware. These items are inspected and test verified by the Process Operator (PO) or Testing Organization (TO), not by the NASA MSFC Safety and Mission Assurance Directorate.

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1.9 Process Operator (PO). Personnel assigned and/or directed by the project office to support the inspection and test process as required by the project and/or quality plan (i.e., routing, receiving, coordinating, facilitating documentation, performing inspections and/or test).

1.10 Property Management Acronym. (PM)

1.11 Quality Sensitive. A term used to identify inspection and test verification by the Safety and Mission Assurance Directorate for flight hardware, flight software, and flight-associated ground support equipment; deliverable products that are to be assembled into a launch vehicle and associated equipment for testing, handling, launching, servicing, and maintaining a vehicle in space; qualification and requalification hardware; and hardware or software procured for development activities when the data resulting from development activities will be used in the “justification for qualification” of flight hardware, software, or flight-associated hardware. Hardware to be used in a hazardous operation may also be designated as quality sensitive by the responsible organization when included in the program/project quality planning documentation.

1.12 Receiving Inspection and Testing. A process performed to verify an item by inspection and test for proper identification, count, condition, function, and a comparison of results with specified criteria.

1.13 Safety and Mission Assurance Acronym. (S&MA)

1.14 Systems Engineer Acronym. (SE)

1.15 Testing. A determination by technical means of the properties or elements of supplies, or components thereof, including functional operation, and involves the application of established scientific principles and procedures.

1.16 Testing Organization Acronym. (TO)

1.17 Test Readiness Reviews (TRR). A pre-test briefing with test participants and/or MSFC management, prior to starting test operations to review test requirements, set-ups, sequences, safety, and emergency shutdown procedures.

1.18 Verify. Review of recorded data (inspection, test, etc.) for conformance to specifications, drawing requirements, etc.

1.19 Witness. To observe a test or process to verify that correct procedures and processes were followed for a specific action.

1.20 –900. Inspection report designator for hardware acceptable in excess of/ or less than the engineering requirements specified.

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2. RESPONSIBILITIES

2.1 The Property Management Group shall be responsible for the following:

2.1.1 Performing initial receiving inspection of items for count and condition. (Ref. MWI 4520.1.)

2.1.2 Initiating receiving inspection and acceptance documentation. (Ref. MWI 4530.1.)

2.1.3 Administrative routing and processing of documentation of nonconforming items.

2.1.4 Transportation of items to NASA S&MA Directorate quality receiving inspection area, the user, or the storage facilities as applicable.

2.1.5 Maintaining all records required by the program/project plan.

2.2 The Procurement Office shall be responsible for the following:

2.2.1 Ensuring receiving inspection and testing requirements are specified on all procurement documents. (Ref. MPR 5000.1/MWI 5100.1.)

2.2.2 Dispositioning all contractual nonconforming items.

2.2.3 Maintaining all records required by the program/project plan.

2.3 The Safety and Mission Assurance Directorate shall perform the following:

2.3.1 Generate a quality plan (MWI 7120.1) to provide the inspection and test verification requirements based upon the program/project plan (MPR 7120.1) for items processed at MSFC or other subcontract facilities.

2.3.2 Document the receiving inspection and test monitoring requirements as part of the procurement documentation process to the requirements of MPR 5000.1, "Purchasing," and MWI 5100.1, "Initiating Procurement Requisitions", for credit card purchases. Forward these requirements to the S&MA Directorate.

2.3.3 Perform the required MR's for receiving, in-process inspection, test monitoring, final inspection, and final acceptance as specified in the procurement quality and/or quality planning requirements.

2.3.4 Process nonconformance documentation generated during receiving, in-process, and final inspection and test activities. (Ref. MPR 8730.3.)

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2.3.5 Initiate inspection documentation measurement requirements that shall include criteria for acceptance and/or rejection, where in the sequence measurement and testing operations are performed, record the measurement results, and type of measurement instruments required and any specific instructions associated with their use (associated with inspection reports, log books, temporary installations, etc), as required by program requirements, specifications, and/or procedures.

2.3.6 Maintain all records required by the program/project plan.

2.3.7 Raw material verification test sample testing shall be performed and monitored by the S&MA Directorate, at a minimum of twice a year, to verify the chemical and physical test reports of raw materials procured and received at MSFC by NASA or their responsible subcontractors (Types of raw materials to be verified are raw materials that have readily available industry standards, where the chemical and physical requirements are clearly specified. Generally these materials are of the metallic type such as aluminum and steel. Exotic materials where the chemical and physical characteristics are not easily available and/or proprietary shall not require retesting unless otherwise specified by the user.). Records of test validation shall be maintained as part of the receiving inspection records data package.

2.4 Program/Project Office shall be responsible for the following:

2.4.1 Providing a program/project plan (ref. MPR 7120.1) that will generate baseline documentation necessary to perform all required inspection and testing.

2.4.2 Facilitating the receiving inspection process. Providing coordination for any receiving inspection testing requirements performed outside of the receiving inspection areas. Applicable requirements for in-house testing shall also be specified as part of the procurement request or included as part of the quality requirements. The failure to include in-house testing requirements can result in a nonconformance during the receiving inspection process by the S&MA Directorate and/or the responsible testing activity. Various Engineering Directorate Departments (Avionics Department, Materials and Process Department, and Engineering Systems Department) have test request and test procedure organizational work issuances that shall be referenced as applicable (ref. MPR 5000.1, MWI 4530.1, MWI 7120.1).

2.4.3 Supporting all offices in the disposition of nonconforming items during all inspection and testing activities.

2.4.4 Supporting the procurement office in the documentation of receiving inspection and testing requirements for non-quality sensitive articles and materials.

2.4.5 Approving the further processing of items that have not completed the required inspection and tests.

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2.5 Testing Organizations shall be responsible for the following in-house testing processes:

2.5.1 Procurement receiving inspection testing as specified in project/quality plans and subsequent approved and/or released test requests, procedures, plans, or organizational work instructions. (Ref. MPR 7120.1, MPR 8040.1, MPR 8060.1.)

2.5.2 Performing Test Readiness Reviews (TRR) and subsequent testing to documented requirements specified by the project plan and controlled and baselined as required by the MSFC Management System (MPR 7120.1, MPR 8040.1, MPR 8060.1). S&MA test surveillance & monitoring, as well as unplanned events, shall be clearly understood as part of the TRR process and documented as required in the test procedure.

2.5.3 Documenting and supporting all nonconformances processed during all testing activities (MPR 8730.3, MWI 4530.1).

2.5.4 Updating testing activities and data as specified by engineering documentation in MSFC log books (MWI 8730.1).

3. PROCEDURE

3.1 Receiving Inspection and Testing

<u>Actionee</u>		<u>Action</u>
PM	3.1.1	Shall perform initial receiving inspection to the requirements of MWI 4520.1. Nonconformances shall be processed in accordance with MWI 4520.1, MWI 4530.1, and MPR 8730.3 as applicable. All articles and materials that require further receiving inspection processing shall be transferred to the S&MA Directorate or user.
S&MA PO,TO	3.1.2	Shall perform receiving inspection and testing for all articles and materials to the requirements of the project quality plan, MWI 7120.1. They shall assure raw material testing to the requirements of paragraph 2.3.7. Nonconformances shall be processed in accordance with MWI 4520.1 and MWI 4530.1, as applicable.
S&MA PO,TO	3.1.3	Shall initiate inspection documentation (inspection reports, log books, temporary installations, etc.) as required by program requirements, specifications and/or procedures. (Ref. MWI 8730.1, and MWI 8730.2.)
CO	3.1.4	Shall disposition contractual nonconforming items prior to

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further processing in accordance with MWI 4520.1 and MWI 4530.1 as applicable.

CO 3.1.5 Shall approve the release of an item(s) prior to completion of receiving inspection in accordance with MWI 4520.1 and MWI 4530.1 as applicable.

S&MA 3.1.6 Shall process as a nonconformance any item accepted as a
PO contractual nonconformance in accordance with MPR 8730.3.

PM 3.1.7 Shall process as a nonconformance (Squawk, MSFC-TAG-6)
S&MA any item(s) released prior to completion of receiving inspection
CO and testing to provide immediate recall of the item in the event
PO of nonconformity to specified requirements (CO approval shall
be required).

Contract replacement of the item once it has been contractually accepted shall require the generation and processing of inspection rejection reports specified in the property management procedure MWI 4530.1.

PM 3.1.8 Shall transfer all receiving inspection and testing documentation
S&MA generated to the applicable records center.

3.2 In-Process Inspection and Testing

S&MA 3.2.1 Shall determine and document in the project/quality plans the
PO in-process inspection and test requirements. (Ref. MPR 7120.1 and MWI 7120.1)

S&MA 3.2.2 Shall perform in-process inspection and testing as specified in
PO,TO approved documentation and record results. Nonconformances shall be processed in accordance with MPR 8730.3.

S&MA 3.2.3 Shall process as a nonconformance (Squawk, MSFC-TAG-6)
PO any item released prior to completion of all in-process
SE inspection and testing in accordance with MPR 8730.3 to provide immediate recall of the item in the event of nonconformity to specified requirements. The nonconformance shall require the disposition approval of the SE prior to further processing

S&MA 3.2.4 Shall verify that all documentation associated with the in-

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TO process inspection and testing has been completed and approved prior to forwarding the item to final inspection and testing.

S&MA 3.2.5 Shall transfer all in-process inspection and testing
PO,TO documentation generated to the applicable records center.

3.3 Final Inspection and Testing

S&MA 3.3.1 Shall perform required final inspection and testing as specified
PO in approved documentation and record results.
Nonconformances shall be processed in accordance MPR 8730.3.

S&MA 3.3.2 Shall process as a nonconformance, using a Discrepancy
PO Record, any item to be released prior to the completion of all
Project Office final inspection and testing in accordance with MPR 8730.3
Management unless otherwise specified in the project plan (i.e., ship short, open work, -900). The nonconformance shall require the disposition approval of the project office prior to shipment. At the time of shipment, the nonconformance report shall be closed and transferred to the receiving facility for the completion of final inspection and testing.

S&MA 3.3.3 Shall verify that all documentation associated with the final
PO inspection and testing has been completed and approved (released – MPR 8060.1 and MPR 8040.1). They shall ensure that any open items are documented (and ready to forward, such as nonconformances) and approved by the project office prior to forwarding the articles or materials to shipping and/or the customer. When there are no open items, final acceptance shall be performed and documented.

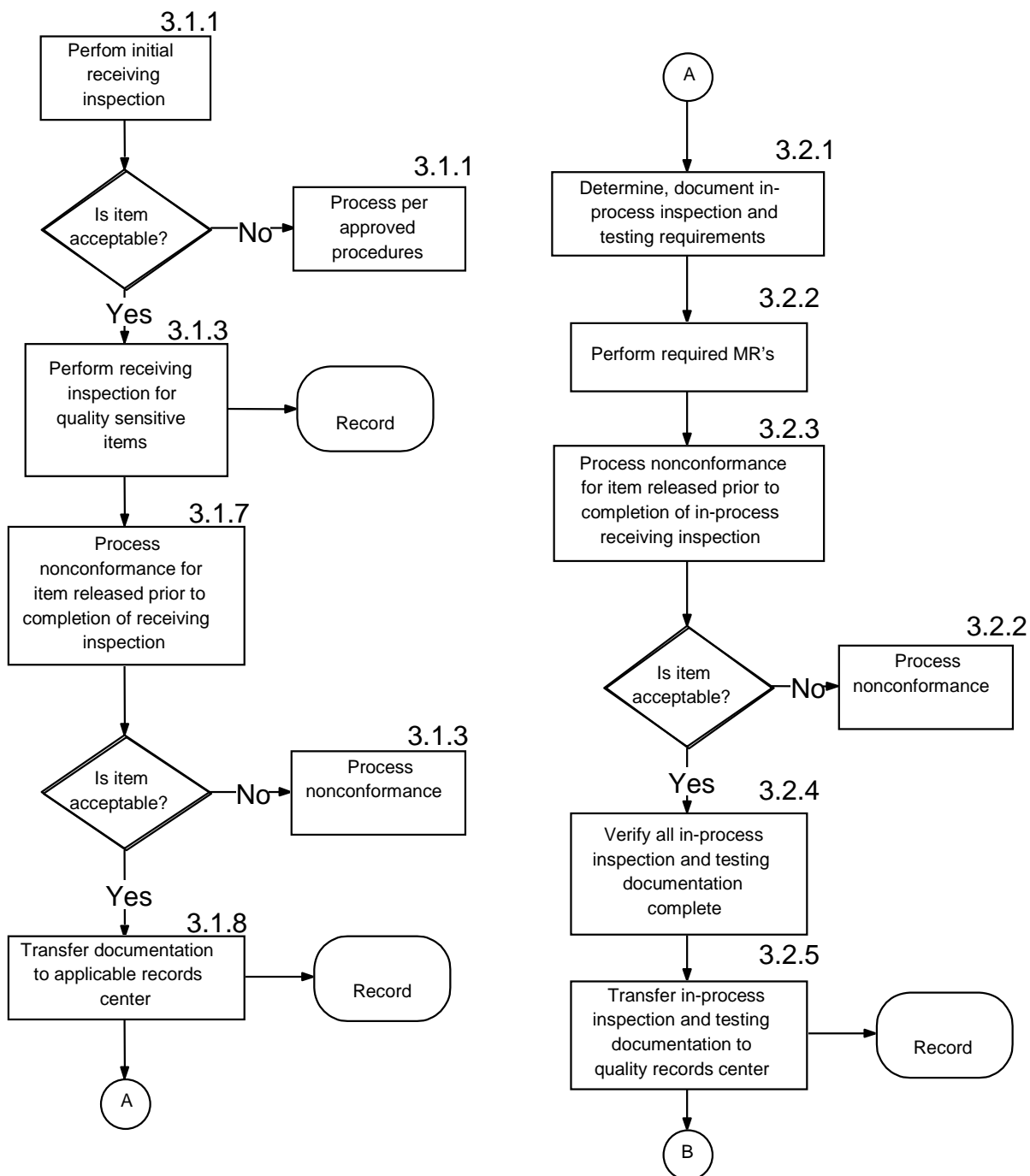
S&MA 3.3.4 Shall transfer all final inspection, final acceptance, and testing
PO,TO documentation generated to the applicable records center.

4. RECORDS

Records generated as a result of inspection and testing activities shall be defined in the project/quality plan and maintained in accordance with MPR 1440.2, “MSFC Records Management Program.”

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5. FLOW DIAGRAM



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